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Chairman Biggert and members of the subcommittee, I am William D. Magwood, IV, Director of the DOE Office of Nuclear Energy, Science and Technology. It is a pleasure to appear here today to discuss our views of the future of nuclear energy research and development and the important role the new Idaho National Laboratory will play in meeting our research objectives. As outlined in the *National Energy Policy* issued shortly after President Bush took office, this Administration is vitally interested in continuing the development of nuclear energy and expanding its use in the U.S.

Over the last three years, we have advanced the agenda for nuclear energy and nuclear research in several significant ways that reflect the focus and commitment the Department has placed on this important energy source. We have established strong cooperation with industry through our Nuclear Power 2010 program, working with utilities to examine the potential of ordering new nuclear power plants for operation in the United States within the next few years. We have developed new, important technology in the Advanced Fuel Cycle Initiative, pointing the way toward a better, more proliferation-resistant nuclear fuel cycle. We have established the Generation IV International Forum, working with the world's advanced nuclear technology nations to identify and develop the most promising next generation nuclear energy technologies for the future.

Our nuclear energy research programs are highly integrated and interdependent. Our Generation IV activities, for example, rely on success in the Advanced Fuel Cycle Initiative to create the advanced nuclear fuels for most of the six next-generation nuclear energy system concepts. Our Nuclear Hydrogen Initiative is dependent upon the success of the Generation IV effort to create the reactor technologies that can supply the very high temperature heat needed to make hydrogen production economic and practical on a commercial scale. This integration can be difficult from a management perspective, but highly beneficial from both a results and an efficiency standpoint. While each program has its own goals and objectives, our success will be greatly magnified when the products of each program are brought together at the end.

All of our programs are characterized by a high degree of independent oversight and peer review. The Nuclear Energy Research Advisory Committee (NERAC) has eight active subcommittees interacting with my Office to pursue our nuclear energy R&D goals. Under the leadership of the Chair, former Deputy Secretary of Energy Bill Martin, and the Vice Chair, former Nuclear Regulatory Commission Chairman John Ahearne, NERAC is one of the most active, engaged, and committed advisory bodies in existence and the time and effort the members of this group have devoted to their advisory role has made a very real and substantial difference in the development of our programs.

All of our programs benefit from a philosophy that to be successful, the next generation of nuclear technologies must not be used just in the United States, or just in Japan, or just in France—but used internationally in a standardized fashion. We often consider the aircraft industry to be a good model. Just as it would not be economically viable to build one or two airliners in each country using unique designs, it will not economically viable to do so with future nuclear power plants. Instead, like the case of airliners, we must benefit from coordinated worldwide efforts and acceptability of a few technologies in many countries. In this way, the market for future plants is large, as are the economies of manufacturing scale.

Because of this view, we have worked hard to bring an international character to all of our programs. We established the Generation IV International Forum, or GIF, with this in mind. That group, in coordination with NERAC, led the evaluation of over 100 different nuclear energy concepts by over 100 expert scientists and engineering from over a dozen countries. After a complex, carefully managed two year process, the GIF concluded that six technology concepts held the most promise for the future and the GIF member countries agreed to establish an international framework to allow all countries to work on the technologies of greatest interest to them in direct partnership with other member countries.

For our part, as we indicated in our report to Congress last year on the U.S. Generation IV program, the Department of Energy has selected one of the six technologies as its lead technology. This technology is now known as the Next Generation Nuclear Plant, or NGNP. The NGNP would be able to make both electricity and hydrogen at very high levels of efficiency; would be deployable in modules that will better fit the high competitive, deregulated market environment in the United States; and would be extraordinarily safe, proliferation-resistant, and waste-minimizing.

The base concept of the NGNP is that of a very-high temperature gas-cooled reactor system coupled with an advanced, high-efficiency turbine generator and even more advanced thermochemical hydrogen production system. We have very high expectations for this technology. As we indicated in our recent request for Expressions of Interest (EOI), we are interested in the eventual deployment of commercial plants that can generate electric power at a cost of less than 1.5 cents/kilowatt hour; produce hydrogen at a cost of less than $1.50/gallon-gasoline equivalent; and cost less than $1000/kilowatt to construct with a goal of $500/kilowatt.

If we are successful in creating such a technology, we will change the game with respect to the energy and environment future of the United States. We will not only assure a vibrant, long-term future for nuclear energy that will allow the Nation to benefit from nuclear energy's enviable environmental qualities, but we will expand its advantages from

electricity production to fueling the Nation's vast transportation system. In doing so, we will enable the President's vision, as articulated in his Hydrogen Fuel Initiative, to be realized far earlier than many thought possible.

The Department is working with its international partners to define the research and development activities that could enable an NGNP to be demonstrated in pilot form before 2020. We have asked the U.S. private sector to submit comments on the NGNP strategy by July 2 of this year, as well as to indicate their potential interest in serving as the Project Integrator.

As noted in the Request for Expressions of Interest, DOE has not made a final decision to construct a NGNP facility. And, although it might be reasonable to infer that should such a decision be made, the NGNP would be located at INL, we have not made a final site selection, nor have we secured the required outyear funding. However, the Department intends that the INL would play a central role throughout the NGNP effort. Should the decision be made to build an NGNP pilot plant, it would be our preferred path to build the facility under a cooperative arrangement with the private sector. We believe that such a project should be, first and foremost, focused on the development of a technology that can be deployed by the private sector sometime after 2020. Such a technology must be flexible, safe, reliable, and consistent with the economic realities of the market (with or without the advent of a "hydrogen economy").

Our EOI noted that one management and funding option the Department is considering is to work with a Project Integrator to pursue this technology. This entity would work closely with the INL to develop and manage research and development plans. In doing so, the INL would attract many new talented scientists and engineers; establish strong ties with industry, academia, and the international community; and evolve in other ways which will set it on the path to establish the Nation's preeminent laboratory for nuclear energy research in 10 years.

This goal is the central objective we have set for the new M&O contractor for the Idaho National Laboratory. The new contractor will have the task of merging the lab operations of Argonne National Laboratory-West and Idaho National Engineering and Environment Laboratory to create a new, multi-program national laboratory that will serve as what Secretary Abraham called the "command center" of a revived nuclear technology, education, and research enterprise in this country.

In this role, the new lab will become a vital partner to the Department of Energy in realizing the vision for nuclear energy we have been developing over the last several years. As such, it cannot be the only location where vital nuclear energy research is performed. We expect that as the "command center" for the nuclear energy program, the INL will form close and productive relationships with other national laboratories—particularly those where important, irreplaceable expertise and capabilities exist today. In particular, Argonne National Laboratory (with its unique expertise in reactor analysis, reactor safety, physics and computer codes); Oak Ridge National Laboratory (which has great expertise in materials and chemical processes); Los Alamos National Laboratory (which has some the Department's finest advanced nuclear fuel technology capabilities); and Sandia National Laboratories (which has outstanding energy conversion, systems engineering, and nonproliferation expertise) will all be important contributors to all of the Department's major nuclear energy R&D efforts. To facilitate this, DOE has established a program management structure that includes National Technical Directors and System Integrators, many of whom are based at DOE laboratories outside of Idaho. This program management structure will help ensure that the best technical talent is brought to bear on DOE's nuclear energy R&D programs, no matter where that talent may reside.

The designation of the INL as the leader for nuclear R&D is consistent with the lab's historic role as the focal point for the development of commercial nuclear power in the world. The first useable quantities of electricity produced by nuclear power occurred at what was then known as the National Reactor Testing Station in Idaho. The first city lighted by nuclear power was Arco, Idaho, using power from a reactor at this facility.

Fifty-two reactors have been built and operated in Idaho over the years, the largest concentration in the world.

Beyond nuclear energy research, we envision the INL becoming a multi-program laboratory, with a broad and varied portfolio of work. We believe that a diverse scope of work activities would provide a sound intellectual basis for the lab and help attract the wide range of expert researchers and technologists from many disciplines that will be needed to allow us to reach our ambitious nuclear energy goals. In addition to its nuclear energy role, the request for proposals indicates that the new INL M&O contractor will:

- Consolidate at the INL the ability to fabricate, test and assemble plutonium-238 power systems needed for both national security and space exploration;

- Establish a Center for Advanced Energy Studies in Idaho Falls, Idaho, in which the INL, Idaho and other regional and national universities cooperate to conduct on-site research, classroom instruction, technical conferences and other events for a world-class academic and research institution;

- Be a lead science and technology provider in nuclear nonproliferation and counter proliferation, and become the Nation's leader in developing science-based, technical solutions protecting the country's critical infrastructure; and

- Research, develop and deploy technologies that improve the efficiency, cost effectiveness and environmental impacts of systems that generate, transmit, distribute and store electricity and fuels.

For the nuclear energy and other missions, we have asked the Nuclear Energy Research Advisory Committee to evaluate the assets in Idaho and to recommend to us improvements it believes we should make not just in facilities and equipment, but also in less tangible areas, such as personnel development and incentives and laboratory culture. We look forward to receiving their recommendations later this year. In the interim, we

continue to plan for the maintenance of the existing facilities at INL and consider new investments in the infrastructure.

In summary, we believe that by returning the Idaho lab to its roots, we are creating a much-needed focal point for the nuclear energy R&D program in this country. As demonstrated by the stockpile stewardship program, the renewable energy program, and others, a large research program can benefit from the contributions of many organizations, but at its core needs a small number of institutions that are focused on making that program a success. We believe that the Idaho lab is the right place for this focus to occur, and that a renewed focus will give a boost to nuclear energy R&D across the U.S.

Thank you for the opportunity to appear before you today, and I look forward to answering any questions you may have.